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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,652	10/27/2003	Keizo Miyata	60188-687	9917

7590 05/19/2005

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EXAMINER

WONG, KIN C

ART UNIT PAPER NUMBER

2651

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,652

Applicant(s)

MIYATA ET AL.

Examiner

K. Wong

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/27/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims (1-14) are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (6483659) in view of Patton et al (5654840).

Regarding claim 8: Kobayashi et al discloses a disk apparatus (as depicted in figure 1 of Kobayashi et al), including:

- a disk (elements 12 and 13 in figure 1 and see associated descriptions for details) on which information is recorded;

- a motor (element 16 in figure 1) for rotating the disk;

- a head (elements 1 and 2 in figure 1) for at least reproducing the information on the disk;

- a head supporting mechanism (element 9 in figure 1) including a general adjustment actuator which has a voice coil motor (VCM - element 11 in figure 1) and has a stroke covering the entire disk and a fine adjustment actuator (elements 5 and 6, and, see associated descriptions for details) which is interposed between the general adjustment actuator and the head and has a stroke smaller than that of the general adjustment actuator;

a controller (elements 30/32 in figure 1) for generating a first driving signal and a second driving signal;

a first driver (element 23 in figure 1) for driving the general adjustment actuator according to the first driving signal;

a second driver (element 24 in figure 1 and see associated descriptions for details) for driving the fine adjustment actuator according to the second driving signal;

a first estimator (element 30 in figure 1 and see associated descriptions for details) for estimating the position of the head displaced due to the driving of the general adjustment actuator based on the first driving signal and the voltage signal to output a first head position estimation signal;

a second estimator (element 31 in figure 1 and see associated descriptions for details) for estimating a displacement of the fine adjustment actuator based on the second driving signal to output a displacement estimation signal;

an adder (adding function is depicted in the junction of the output of element 31 and the output of element 32 for adding of the two outputs) for adding together the first head position estimation signal and the displacement estimation signal to output a second head position estimation signal;

and a position error-related signal generator for generating from a target position signal which indicates a target position of the head and the second head position estimation signal, a position error estimation signal which indicates an error of the head with respect to the target position, wherein the controller corrects the first driving signal and the second driving signal based on the position error estimation signal (in col. 4,

line 29 to col. 5, line 11 where Kobayashi et al describes the generation of the position error and correction signal for the movements of the actuators). Thus, Kobayashi et al disclosed a disk drive with estimated control for driving the disk drive.

However, Kobayashi et al is silent on the voltage detector (backemf detection) for feedback control of the VCM. Patton et al is relied for teaching voltage detection or backemf detection on the VCM in the feedback control loop (see figure 1 and abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the feedback loop of Kobayashi et al with the voltage detection of the VCM as taught by Patton et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to provide alternative way to detect shock in the drive as suggested in col. 3, lines 15-44 of Patton et al.

Regarding claim 9: Kobayashi et al teaches that wherein the position error-related signal generator generates a position error signal which indicates an error of the head with respect to the target position by reproducing, with the head, servo information recorded in advance on the disk; and the controller corrects the first driving signal and the second driving signal selectively using one of the position error estimation signal and the position error signal (in col. 6, lines 12-58 where Kobayashi et al describes the using the position error for generating the corrected control head signal).

Regarding claim 10: Kobayashi et al teaches that wherein the controller corrects the first driving signal and the second driving signal at a predetermined cycle that is shorter than a sampling cycle of the servo information; in a period during which the servo information is reproduced with the head, the position error signal is used; and in a

period during which the servo information is not reproduced with the head, the position error estimation signal is used (in col. 6, line 59 to col. 7, line 61 where describes the required time frame for generating the corrected head signal in the control of the actuators).

Regarding claim 11: the combination of Kobayashi et al and Patton et al teaches that the disturbance (vibration or shock) compensator for synthesizing a disturbance compensation signal which indicates an estimated magnitude of disturbance acting on the general adjustment actuator with the first driving signal to generate a disturbance-compensated first driving signal, wherein the first estimator estimates the magnitude of the disturbance acting on the general adjustment actuator based on the disturbance-compensated first driving signal and the voltage signal to generate the disturbance compensation signal (in col. 8, lines 6-22 of Kobayashi et al and in col. 7, lines 27-67 of Patton et al).

Regarding claim 12: the combination of Kobayashi et al and Patton et al teaches that wherein the first estimator sequentially corrects the first head position estimation signal based on the detected head position that is obtained by reproducing the servo information with the head (in col. 4, lines 29-50 of Kobayashi et al).

Regarding claim 13: Kobayashi et al teaches that wherein the fine adjustment actuator is formed by a piezoelectric element (in col. 3, line 56 to col. 4, line 2).

Regarding claim 14: Kobayashi et al teaches that wherein the piezoelectric element has a characteristic that causes a displacement generally proportional to the second driving signal (in col. 4, line 29 to col. 5, line 11).

Regarding claims 1-7: the method claims (1-7) are drawn to the method of using the corresponding apparatus claimed in claims (8-14). Therefore method claims (1-7) correspond to apparatus claims (8-14) and rejected for the same reasons of obviousness as used above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Stevens et al (6747836), Hsin et al (6741417), Morris (59787520) and Takaishi (6088187) are cited for dual stage actuator controls.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Wong whose telephone number is (571) 272-7566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kw

16 May 05

A handwritten signature, possibly reading 'KW', is written in black ink.